ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY · BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

October 19th, 1954
Vol. 12...No. 5

Dear Sir:

An investment group interested in the commercial possibilities of nuclear energy has now been formed in Washington. Robert Le Baron, former Deputy Secretary of Defense for Atomic Energy, and chairman of the military liaison committee to the USAEC, has been retained by the group. Mr. LeBaron and staff will investigate potential investments in such fields as: nuclear plants for high fossile-fuel-cost areas; radiation sterilization of food; applications of radiation in the medical field; and other applications. The investing group includes: R.W. Dowling, N.Y.; Harvey S. Firestone, Jr., Akron, O.; Gardner Cowles, N.Y.; Eric Johnston; Robert M. Kyes; Marvin Braverman, Washington; and representatives of T. Mellon & Sons, Laurance Rockefeller, Vincent Astor, and the Brady Estate. Charles P. McCormick; Harris McIntosh; and G.H. Walker are also in the group. (Other BUSINESS news, page 2 this LETTER.

Under a contract now given Pronto Uranium Mines (Canada) by the Canadian Government's Eldorado Mining & Refining, that firm will supply Eldorado with $55 million worth of uranium concentrates. Pronto estimates that its orebody has a recoverable value of $63 million. Pronto's bond issue ($6 million) is now being floated, and it is expected that the issue will be fully taken up. (Other RAW MATERIALS news, page 3 this letter.)

A nuclear power study is now to be undertaken by the Pennsylvania Power and Light Co., Allentown, Pa., under a new USAEC agreement made with the firm. The economic and engineering feasibility of a large-scale, nuclear-fueled power plant for use in its own system will be investigated by Pennsylvania Power in this study. It is the fifteenth such study to be made by interested firms under the USAEC's industrial participation program. (Pennsylvania Power was one of the several firms which submitted proposals for participation in the construction and operation of the pressurized water reactor. Duquesne Light Co., Pittsburgh, was selected by the USAEC for this plant, now going up at Shippingport, Pa.) (Other NUCLEAR REACTOR news, page 3 this letter.)

A new facility which can separate and purify fission products for industrial, medical and other uses is now to be constructed at Oak Ridge, Tenn., at an estimated cost of $1,500,000. The plant, which will greatly expand the "hot chemistry" facilities in the radioisotope program, will be operated by Union Carbide and Carbon Chemicals Co. (div. of UC&C). It will provide equipment for separation and purification of 200,000 curies per year of cesium-137, an important long-lived, gamma-emitting isotope, as well as large quantities of strontium-90, a valuable source of beta radiation. Fabrication facilities provided will be capable of producing single radiation sources containing approximately 2000 curies each, with provisions for combining two or more 2000 curie units into larger sources.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY · BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

October 19th, 1954
Vol. 12...No. 5

Dear Sir:

An investment group interested in the commercial possibilities of nuclear energy has now been formed in Washington. Robert Le Baron, former Deputy Secretary of Defense for Atomic Energy, and chairman of the military liaison committee to the USAEC, has been retained by the group. Mr. LeBaron and staff will investigate potential investments in such fields as: nuclear plants for high fossile-fuel-cost areas; radiation sterilization of food; applications of radiation in the medical field; and other applications. The investing group includes: R.W. Dowling, N.Y.; Harvey S. Firestone, Jr., Akron, O.; Gardner Cowles, N.Y.; Eric Johnston; Robert M. Kyes; Marvin Braverman, Washington; and representatives of T. Mellon & Sons, Laurance Rockefeller, Vincent Astor, and the Brady Estate. Charles P. McCormick; Harris McIntosh; and G.H. Walker are also in the group. (Other BUSINESS news, page 2 this LETTER.

Under a contract now given Pronto Uranium Mines (Canada) by the Canadian Government's Eldorado Mining & Refining, that firm will supply Eldorado with $55 million worth of uranium concentrates. Pronto estimates that its orebody has a recoverable value of $63 million. Pronto's bond issue ($6 million) is now being floated, and it is expected that the issue will be fully taken up. (Other RAW MATERIALS news, page 3 this letter.)

A nuclear power study is now to be undertaken by the Pennsylvania Power and Light Co., Allentown, Pa., under a new USAEC agreement made with the firm. The economic and engineering feasibility of a large-scale, nuclear-fueled power plant for use in its own system will be investigated by Pennsylvania Power in this study. It is the fifteenth such study to be made by interested firms under the USAEC's industrial participation program. (Pennsylvania Power was one of the several firms which submitted proposals for participation in the construction and operation of the pressurized water reactor. Duquesne Light Co., Pittsburgh, was selected by the USAEC for this plant, now going up at Shippingport, Pa.) (Other NUCLEAR REACTOR news, page 3 this letter.)

A new facility which can separate and purify fission products for industrial, medical and other uses is now to be constructed at Oak Ridge, Tenn., at an estimated cost of $1,500,000. The plant, which will greatly expand the "hot chemistry" facilities in the radioisotope program, will be operated by Union Carbide and Carbon Chemicals Co. (div. of UC&C). It will provide equipment for separation and purification of 200,000 curies per year of cesium-137, an important long-lived, gamma-emitting isotope, as well as large quantities of strontium-90, a valuable source of beta radiation. Fabrication facilities provided will be capable of producing single radiation sources containing approximately 2000 curies each, with provisions for combining two or more 2000 curie units into larger sources.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

BUSINESS NEWS...in the atomic energy field...

EXPANSION OF NUCLEAR ENERGY RESEARCH FACILITIES PLANNED: A $1,535,000 expansion of its nuclear energy research facilities is now to be undertaken by Battelle Institute, Columbus, Ohio. The new facilities, which will be in addition to Battelle's present $2 million investment in such facilities, will include construction of a nuclear reactor, a reactor development laboratory, and a nuclear fuels laboratory. The nuclear reactor planned will be of the "swimming-pool" type (reactor core submerged in a tank of water which serves as moderator, coolant, and shield) capable of operating at 1000-kw. The nuclear fuels laboratory will provide equipment for chemical, physical, and metallurgical studies of reactor fuels, while the reactor development laboratory will permit experimental evaluation of mock-ups of large power reactors. Thus, industry will be provided with research equipment needed for development of commercial power generating plants by nuclear means. Construction work on these three facilities is expected to start about the first of next year on a 397-acre tract near West Jefferson, O. (Battelle will also install, shortly, a 2,000 curie cobalt-60 source. To be ready about mid-November, it will be used primarily for activation studies of chemical reactions; for sterilization studies of drugs, foods and medical supplies; and for other studies of radiation effects.)

INSURANCE COMPANIES URGED TO MAKE RISK CAPITAL AVAILABLE FOR NUCLEAR PROJECTS: The financing of industrial operations involving nuclear energy should be entered into by insurance companies, Charles M. White, president, Republic Steel Corp., suggested last fortnight in Chicago at a meeting of the American Life Convention. He said that those who lease fissionable materials and enter the new atomic field will need plenty of risk capital. Such a step, he pointed out, will be neither cheap nor easy. Insurance companies are perhaps the only such source of investment funds, he stated.

NEW RESEARCH LABORATORY TO AUGMENT NUCLEAR AIRCRAFT ACTIVITIES: A new research laboratory, to be known as the Hartford Research Facility,, and which will be built by the U.S. Air Force in conjunction with Pratt & Whitney Aircraft, will provide additional research facilities for Pratt & Whitney's present work on an aircraft nuclear power plant. Holder of a contract for such work, Pratt & Whitney of late has been continually expanding the staff attached to this project. This new research laboratory, estimated to cost $30 million, will be erected at E. Hartford, Conn.; a contract for ascertaining design criteria, in connection with the new laboratory, has now been let by P & W to a firm of architectural engineers.

URANIUM PROCESSING PLANTS TO EXPAND: A major construction program, which will expand the USAEC's feed materials production and processing plants in three sites, is estimated to cost $67,000,000. In the St. Louis area, $39,800,000 will be put into new refining facilities which will be operated by Mallinckrodt Chemical Works; this will be an expansion of Mallinckrodt's present refinery operations for the USAEC in St. Louis. Some expansion will also occur at the existing plant, but most of the new construction will be at a new site. (Mallinckrodt, under a prime USAEC contract, converts high-grade uranium ore and concentrates into highly purified uranium compounds or metal.) Design of this new plant will be done by Blaw-Knox Construction Co.; it will consist of a purification unit, a uranium chemical unit, uranium foundry, and auxiliary units. At Fernald, Ohio, where similar refining operations are conducted at the Feed Materials Production Center, expansion will cost $20,100,000, and will involve modification of a number of existing buildings and equipment and auxiliary facilities. The Center is operated by National Lead Co. of Ohio, under a prime USAEC contract. The design work on this expansion will be done by Singmaster & Breyer, New York. At Paducah, Ky., the program involves a $7,000,000 expansion of the facilities. The work includes enlargement of an existing building, and equipment, and construction of a new building with approximately 4,000 square feet of floor space. Carbide and Carbon Corp. operate Paducah for the USAEC, producing uranium-235 by the gaseous diffusion process. Giffels & Vallet, Inc., Detroit, will design the expanded Paducah facilities.

NUCLEAR REACTORS...for economic power & for research...

Underseas Craft is Delayed: Sea trials of the U.S. submarine Nautilus, world's first vehicle to be propelled by a nuclear reactor furnishing heat energy, have been delayed three months, according to the Navy's Bureau of Ships. Because of the failure of lengths of 1½" piping, extensive replacement will be necessary, the Navy stated. The piping is in an area of high vapor pressure. It failed during routine tests last month, and it was subsequently found that the firm supplying it had failed to meet specifications, the Navy explained.

First Nuclear Reactor for Switzerland: A recent Belgian-Swiss agreement allows sales to Switzerland by Belgian of supplies of uranium ore mined from Belgian-controlled Unione Miniere du Haut Katanga properties in North Africa; refining will be done at British facilities. Physicists of Belgian and Switzerland, through this agreement, will exchange scientific information on construction and exploitation of nuclear reactors. A Swiss reactor has also been decided upon. It will be built by the Swiss electrical firms of Brown, Boveri & Co., Baden; Escher, Wyss Corp., Zurich; and Sulzer Bros. & Co., Winterthur. Construction is expected to start within a year, with some $4,640,000 to be spent on it.

Contractors Selected for Pilot Plant: Contracts have now been negotiated with the two firms who will do much of the work on the USAEC's experimental boiling water reactor to be built at Argonne National Laboratory (DuPage County, Ill.) as a pilot operation of a commercial nuclear power plant. Sargent & Lundy, Chicago, will be the architect-engineer for the design of the reactor. Allis-Chalmers Manufacturing Co., Milwaukee, under its contract, will do such work as develop components of a power system provided with special sealing devices that will make them tight against leakages of steam, air, or water. Such a development will make possible the economic use of heavy water instead of light water in the boiling water system. The overall work of Allis-Chalmers will comprise the design, development, construction, and installation of the power generation, heat transfer and special equipment for the power cycle. The reactor will produce 20,000-kw. of heat, and 5,000-kw of electricity. Argonne National Laboratory, where initial experiments on the reactor during the past two years produced promising results, will coordinate the work of the project and will design and construct the reactor core and the reactor control mechanism.

Ship-Propulsion-Reactor Work Initiated: Development of a nuclear reactor power plant for a surface vessel, a project which had at one time been started and then postponed, is now under way again. With the reinstatement of the project, Westinghouse Electric will do research and development in Pittsburgh, on the reactor, while the Navy's Bureau of Ships has assigned separate design studies for the hulls to Newport News Shipbuilding & Drydock Co., and to Bethlehem Steel Corporation's shipyard at Quincy, Mass. The reactor decided upon will be of the pressurized water type.

RAW MATERIALS...prospecting, mining & marketing...

UNITED STATES:-Denver, Colo.- In a transaction consumated last fortnight, the entire assets of Gateway Mining and Development Co. have been sold to Flanders Mining Co. for a reported $1,250,000. The claims had been originally staked by J. & R. Lewis, who sold their interest to Gateway. The partnership owning Flanders includes L. Van Atta, Dallas, Tex. and F. L. Anderson, Atherton, Calif. .....Salt Lake City, Utah - A merger is planned by Apache Uranium Corp., and Blackjack Uranium Corp., officials of the firms now state. The agreement will be voted upon this week..... A new ore buying station at Riverton, Fremont County, Wyoming, operated for the USAEC by American Smelting & Refining Co., and to be in operation next year, will provide a market for the Wind River Basin ores which previously had been shipped to Edgemont, S. D.

CANADA:- Good results from drilling on the property of Cayzor Athabaska Mines at Jean Lake, Beaverlodge area, Northern Saskatchewan justify underground work, according to H. T. Leslie, mining engineer at the property..... Peter-Rock Mining Co. has found high radioactivity at its property north of Bancroft, Ont., according to F. P. McGuire, president of the firm. Additional work is now being done.

ATOMIC MEDICINE: Remarks (condensed for this LETTER) of Lewis L. Strauss, Chairman, USAEC, at United Hospital Fund campaign opening, Oct. 4, 1954, in the City of New York.

In atomic medicine, the volunteer hospitals have been in the forefront. As early as 1941, Memorial Hospital (N.Y.) was using phosphorous-32 made in the cyclotron of the University of Calif., Berkeley, to treat leukemia. About that time, Presbyterian Hospital (N.Y.) began experiments with radioisotopes of iodine from the M.I.T. cyclotron. By 1943, radioactive sodium was being used in heart studies.

Now, it is interesting to note the widespread uses of a great variety of isotopes in the study and treatment of a host of diseases. Radiogold has been demonstrated as an effective palliative treatment of widespread cancer within the abdominal cavity. Iodine-131 is now known to be dramatically useful in the treatment of hyperthyroidism. Phosphorous-32 has been found effective in the treatment of leukemia (as I previously noted), and of polycythemia vera, especially. And these treatments are carried on routinely in many hospitals and clinics throughout the United States.

We have recently learned, too, that the use of phosphorous-32 is an invaluable tool in distinguishing between malignant tumors of the eye and non-malignant growths. This information is now the means of avoiding unnecessary surgery in many cases.

Another recent development--still in the research stage--concerns the use of radioactive sodium in connection with skin grafts. Ideally, the pedicle skin graft should be transferred as soon as possible, but not until the cells of the graft have commenced vascularization. Through the use of radioactive sodium, it should be possible to determine with considerable precision just when an adequate blood supply is present in the graft.

One of the most immediately practical developments of atomic energy in the medical therapy field has been in the use of high specific activity radioisotopes in teletherapy machines, which, because of inherent simplicity of operation and accuracy of dosimetry have been found to have certain advantages over the high energy X-ray machines. Such devices using cobalt-60 have not only proven to be extremely useful in the treatment of cancer, but are enjoying considerable popularity among radiologists. The Oak Ridge Institute of Nuclear Studies' Medical Division has in the past few years been devoting a major effort to the development of a similar device which would employ radiocesium, one of the by-products from atomic energy production activities. This radioisotope emits a gamma ray with an energy range approximately half that of radio cobalt, but equivalent to the effective output of a million volt X-ray machine. In addition, it has a relatively long half-life of some 33 years. (Cesium teletherapy machines, because of the lower energy of the gamma rays, require less shielding, hence can be made lighter in weight which will facilitate more accurate rotational therapy of moderately deepseated cancers.)

Rapid strides have also been made in the adaptation of nuclear reactors for medical purposes. In this connection, there is the work at Brookhaven National Laboratory, Long Island, on the irradiation of brain tumors. It has been observed that soluble boron-10 solutions are selectively absorbed by brain tumors, and remain in the tumor in sufficient concentration (as compared with the nearby normal tissue) long enough to permit treatment with thermal or slow neutrons from the atomic pile. What is done at Brookhaven is to take the patient to the top of atomic pile and inject a salt of boron-10 intravenously into the patient. At the time when the greatest concentration of boron-10 is expected in the tumor, the patient's head is exposed to a beam of neutrons coming from the reactor. This produces a very intense, localized radiation treatment of the tumor cells. This is not a cure; patients lives have, however, been prolonged from three to seven months. Patients treated so far have been in advanced stages of the disease; results have, however, led to the belief that as knowledge and experience are gained, this type of treatment will be found to be more and more effective, especially if administered during the early stages of tumor growth. And, theoretically at least, the technique can be extended to malignancy occurring in certain other parts of the body. Up to the present time, treatments such as have been carried on at Brookhaven could only be done at USAEC installations where a sufficiently high flux of neutrons were available. Now, however, there are commercial designs of reactors, planned especially for medical research and therapy.

ATOMIC PATENT DIGEST...grants & other news in nuclear field...

NEW GRANTS:-Vacuum pump of the vapor-stream type. Comprises (in part) a pumping vessel having two opposite open sides, one open side attached to a vacuum vessel, with a bottom wall slanting downward from the vacuum vessel toward the second open side of the pumping vessel. A tubular nozzle extends inwardly from one of the walls; it is located horizontally midway between the top and the bottom, with the nozzle open along a major portion of its length on the side opposite the vacuum vessel, and is adapted to discharge fluid toward the exhaust flue. U. S. Pat. No. 2,691,481 issued Oct. 12th, 1954; assigned to United States of America (USAEC). (Inventor: Kenneth M. Simpson.)

Valve leak detector for use in a system for fluid at above atmospheric pressure. Comprises (in part) a flexible member forming a part of a continuous and positively sealed barrier separating the fluid system from the outside atmosphere, while a second flexible member forms a chamber between it and the first flexible member. Means are provided for supplying gas to the chamber at a pressure intermediate that of the liquid and that of the atmosphere, while means responsive to gas pressure in the chamber will indicate any leak at the second flexible member resulting in the escape of gas from the chamber to the atmosphere and the reduction of gas pressure in the chamber. U.S. Pat. No. 2,691,773 issued Oct. 12th, 1954; assigned to United States of America (USAEC). (Inventor: Harold V. Lichtenberger.)

LICENSES AVAILABLE: A new group of U.S. Government-owned patented inventions, developed in the course of nuclear research under USAEC-auspices, is now available for royalty-free (non-exclusive) licensing. Inquiries concerning this latest list (which follows) as well as previous inventions made so available, should be sent to Patent Branch, USAEC, Wash. 25, D.C. (1) Circuits for regulating the speed of an alternator so that the frequency of the voltage will be substantially constant. U.S. Pat. No. 2,685,670. (2) Refining and casting beryllium metal using a novel flux composition. U.S. Pat. No. 2,686,946. (3) An improved, relatively inexpensive portable radiation measuring device for personnel. U.S. Pat. No. 2,687,480. (4) & (5) Preparation of uranium tetrachloride. U. S. Pats. No. 2,688,529 & 530. (6) Radiation measuring apparatus for drill hole boring. U. S. Pat. No. 2,688,703. (7) Device responsive to changes in the molecular density or composition of gases. U.S. Pat. No. 2,689,309. (8) Remote positioning mechanism with the restraining force at the load end transmitted to the operator's hand at the control end. U.S. Pat. No. 2,689,318. (9) Translating, rotating, bearing device for bodies under load and in parallel planes. U.S. Pat. No. 2,689,753. (10) Improved cyclic process for producing water of increased deuterium oxide content. U.S. Pat. No. 2,689,782. (11) Multi-function telemetering system for controlling and observing a large number of items in the high-voltage electrodes of machines, such as Van de Graaff generators. U.S Pat. No. 2,689,949. (12) Process for recovering a highly purified uranium oxide from an ore such as pitchblende. U.S. Pat. No. 2,690,376. (13) Production of water having a high percentage of heavy water or deuterium oxide. U.S. Pat. No. 2,690,379. (14) Improved method of concentrating an isotope (such as deuterium) in a liquid (such as water). U.S. Pat. No. 2,690,380. (15) Method of concentrating deuterium in cyclohexane and hydrogen. U.S. Pat. No. 2,690,381. (16) Dual temperature isotope exchange process. U.S. Pat. No. 2,690,382. (17) Commercial production of uranium in powdered form by electrolyzing the raw material at approximately 900 deg. C. U.S. Pat. No. 2,690,421. (18) Drill hole logging probes for detecting the presence of radioactive substances in drill holes. U.S. Pat. No. 2,690,468. (19) Improved method and apparatus for producing gaseous ions of the metals such as, for example, copper, cobalt, or uranium, under vacuum by establishing an electric arc discharge in vacuum. U.S. Pat. No. 2,690,515. (20) Electric arc discharge device capable of producing in quantity a substantially continuous supply of gaseous ions under vacuum such as are required in procedures and apparatus for separating or concentrating isotopes. U.S. Pat. No. 2,690,521.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

October 19th, 1954